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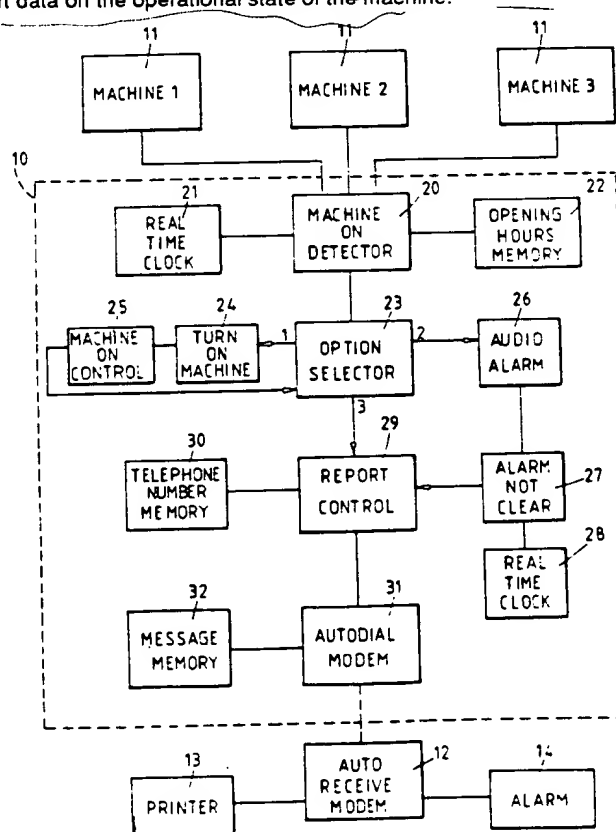
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(54) Monitoring of amusement machine operation

(57) In order to enable remote monitoring of amusement machine operation and prevent loss of takings due to the machine being out of operation for instance, a monitoring device 10 is provided having a detector 20 for receiving input signals from the machine and for emitting output signals indicative of an operational state of the machine, for example whether the machine is switched on at the required times. An error signal is outputted by processing means 23 when the form of the output signals is such as to indicate that a parameter of the operational state of the machine is outside a permitted range. In such an event a report control unit 29 causes a predetermined telephone number to be dialled and the dialled number to be automatically supplied with report data on the operational state of the machine.

FIG. 1.



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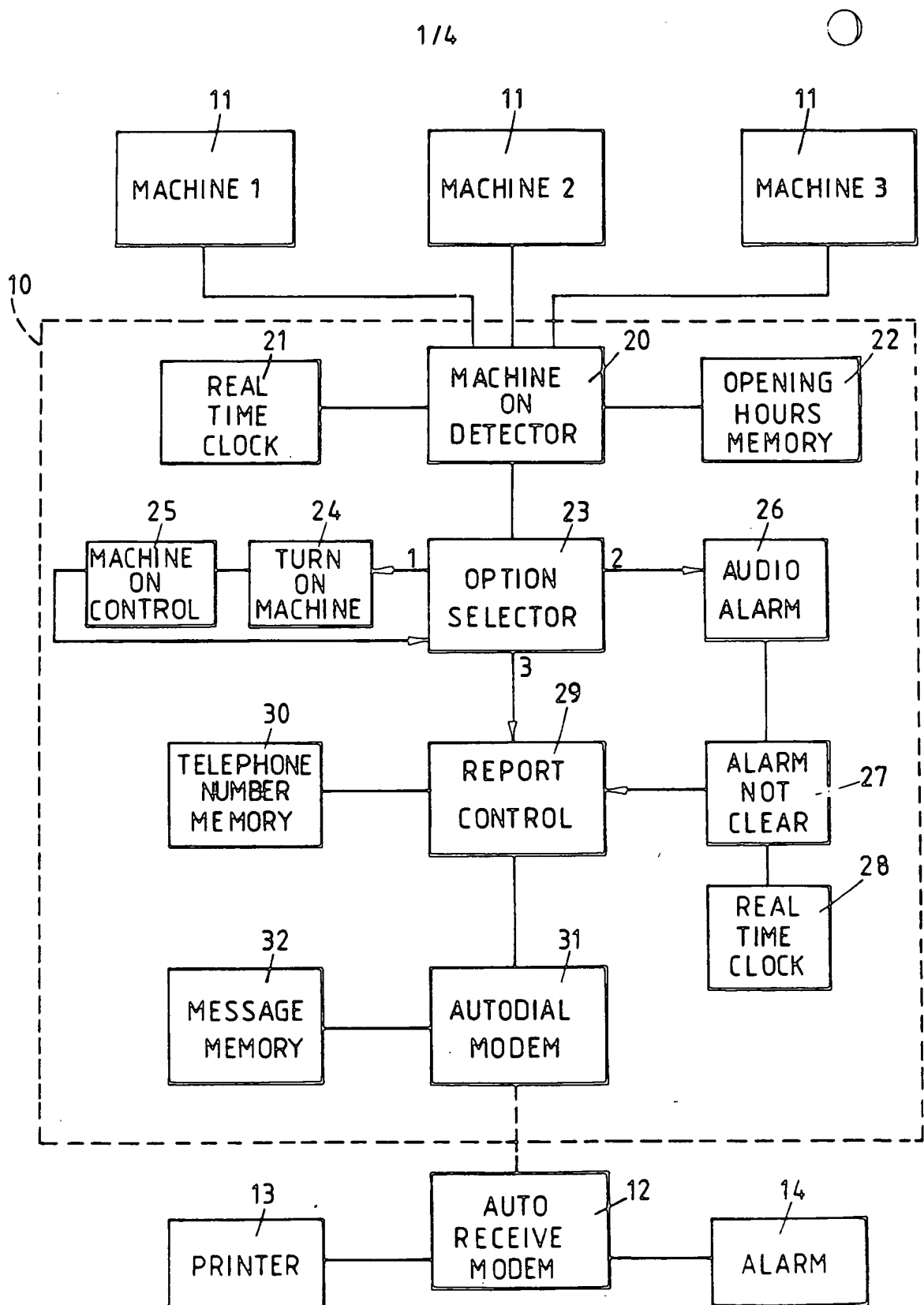


FIG. 1.

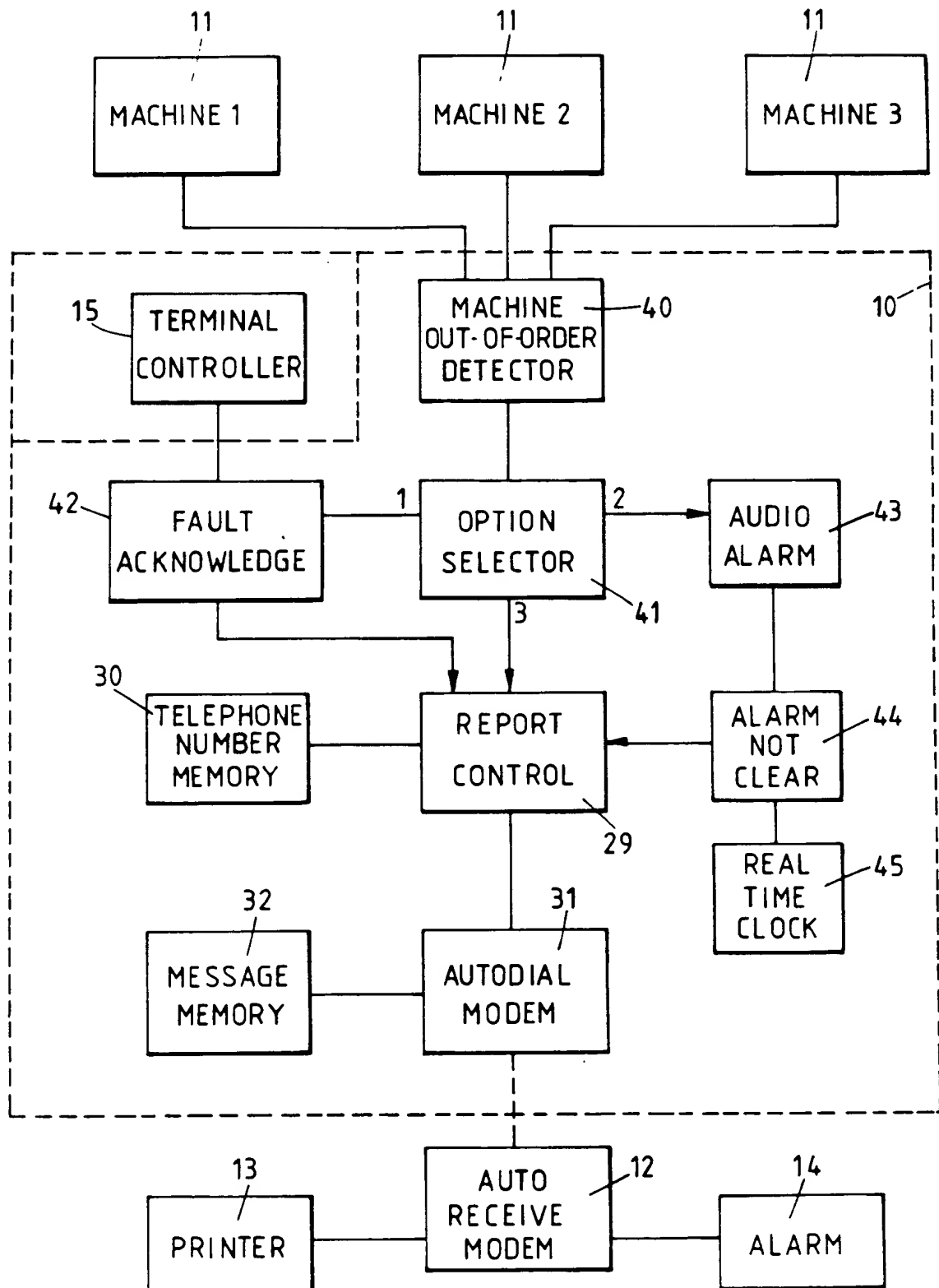


FIG.2.

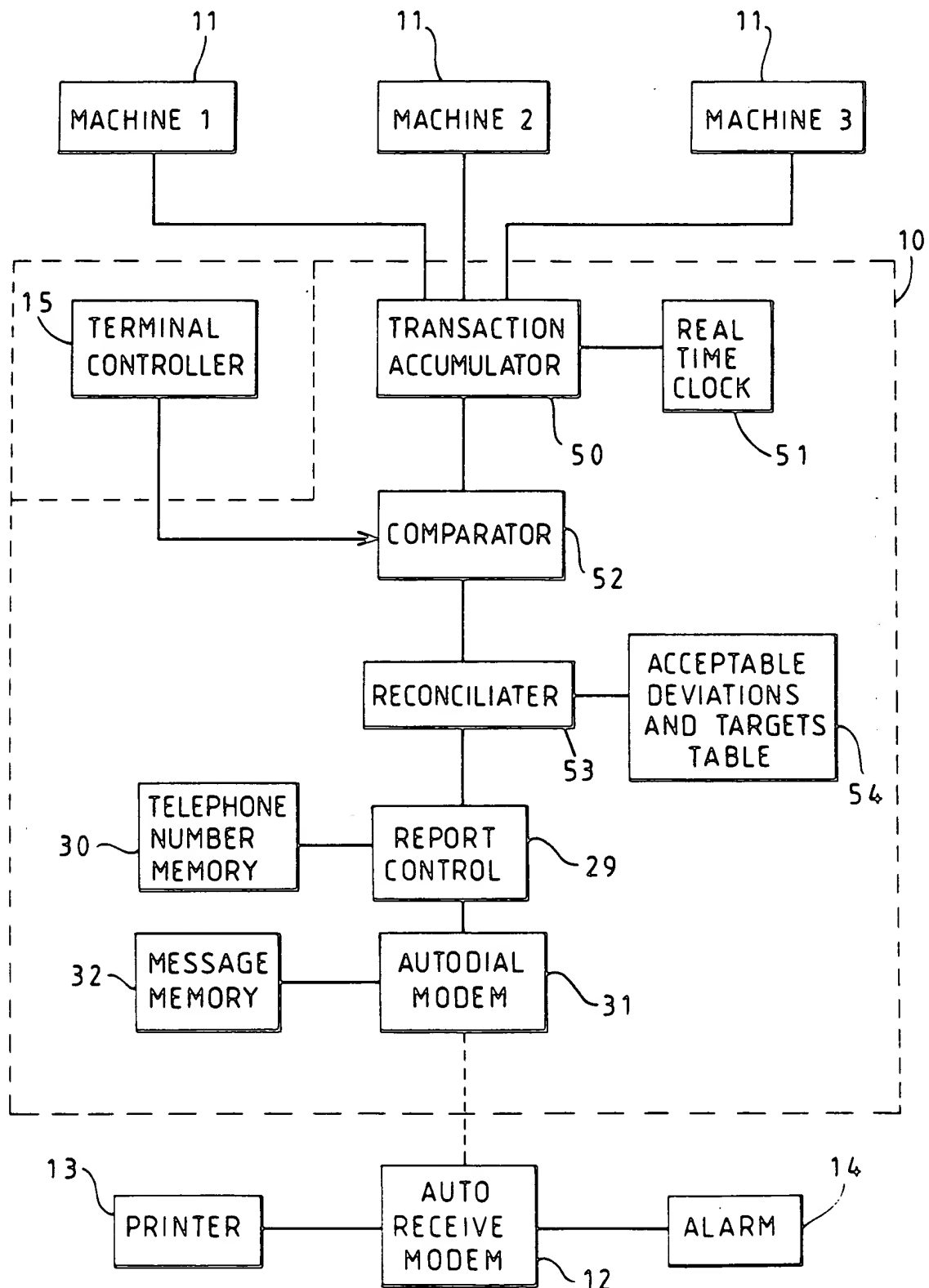


FIG.3.

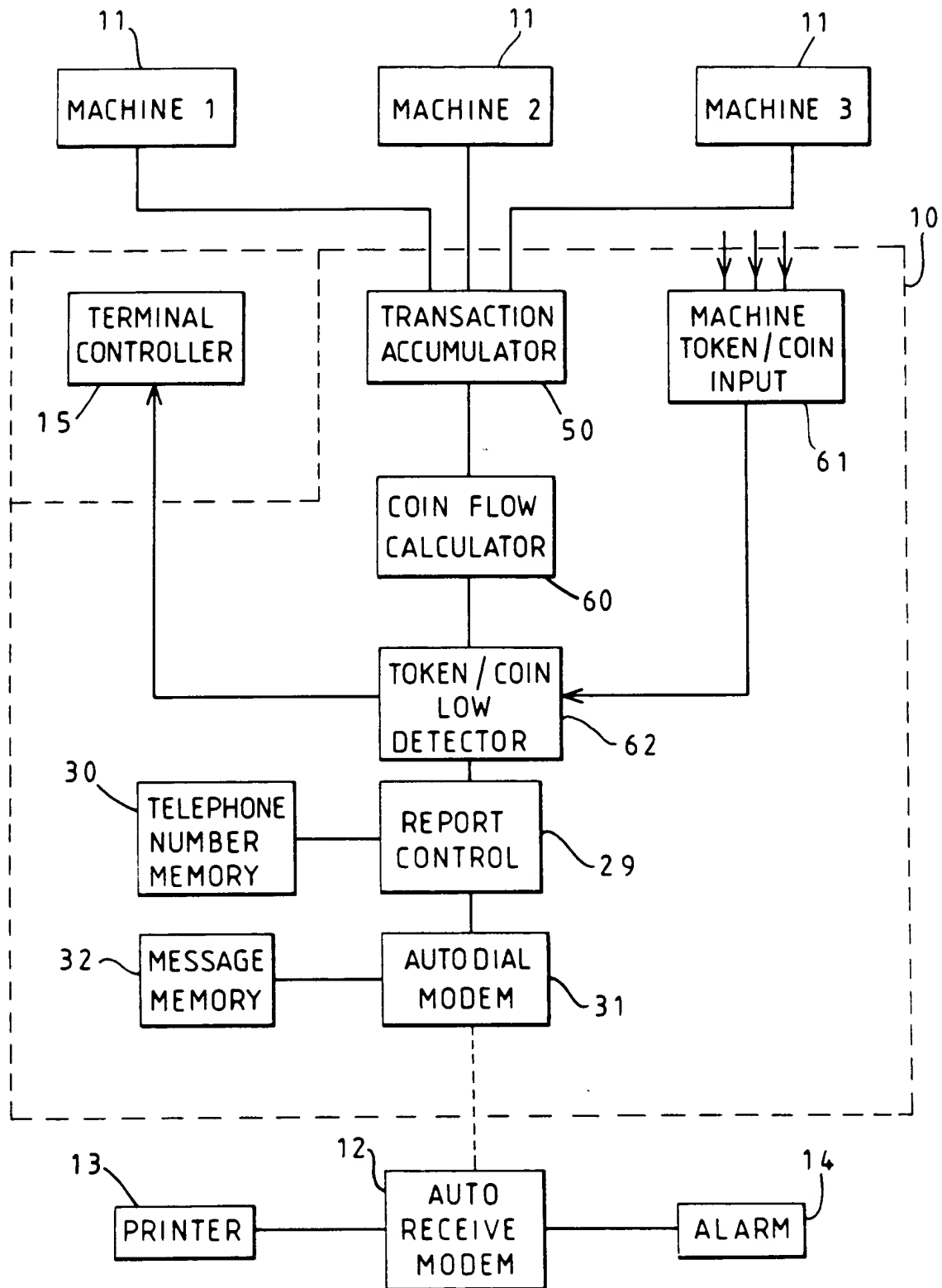


FIG.4.

"Monitoring of Amusement Machine Operation"

This invention relates to devices for monitoring operation of one or more amusement machines.

5 It is standard practice for amusement machines to be installed by an operator at a site which is the property of a site owner who rents the machine from the operator. The takings from the machine belong to the site owner, and it is the responsibility of the operator to service the machine and to replace the machine when
10 necessary. The operator also employs a collector who periodically visits the machine in order to empty the machine and report the takings to the site owner.

Typically the site in which the machine is located is a public house, and the site owner is a
15 brewery. In this case it is the responsibility of the manager of the public house to switch the machine on and off so that it is operational during opening times, and to report to the operator if the machine is faulty so that the machine may be rapidly repaired by the operator. In
20 order to report a fault, the manager must often leave the bar at a busy time in order to telephone the operator, and he may not be successful in reporting the fault at the first attempt if the appropriate telephone number is engaged. The result of this is that the operator may not
25 be informed of a fault until after a substantial delay, or may even only learn of a fault as a result of the collector visiting the premises. This can lead to considerable drop in income to the brewery from the

machine.

It is an object of the invention to provide a device for monitoring operation of one or more amusement machines which is capable of overcoming, or substantially
5 alleviating, the problems currently encountered in operation of such machines.

According to the present invention there is provided a device for monitoring operation of one or more amusement machines, the device comprising detector means
10 for receiving input signals from the or each machine and for emitting output signals indicative of an operational state of the or each machine, processing means for receiving said output signals and for outputting an error signal when the form of the output signals is such as to
15 indicate that a parameter of the operational state of the or a machine is outside a permitted range, and remote reporting means for causing a predetermined telephone number to be dialled in the event that an error signal is outputted by the processing means which is indicative of a
20 reportable condition and for causing the dialled number to be automatically supplied with report data on the operational state of the relevant machine.

Such a device may serve to monitor one or more functions of an amusement machine, and, when connected to
25 an autodial modem, to report to the operator, either fully automatically or in response to key operation, in the event of faulty or unexpected machine operation.

In one embodiment the processing means is

adapted to determine whether the or each machine is switched on at predetermined times. In this case the device may include alarm means arranged to be actuated by the processing means in the event that the machine or one
5 of the machines is not switched on at the predetermined times. Furthermore the processing means may be adapted to actuate the remote reporting means in the event that the machine has not been switched on a predetermined time after actuation of the alarm means. This embodiment will
10 tend to minimise loss of income due to machines not being switched on during opening times.

In another embodiment the processing means is adapted to determine whether the or each machine is out of order. In this case the device may also include fault
15 acknowledgement means adapted to actuate the remote reporting means in the event that an error signal is outputted by the processing means only after the existence of a fault has been acknowledged by a manual key operation. This embodiment tends to minimise loss of
20 income due to unreported faults.

In another embodiment the processing means is adapted to compare actual machine performance with predetermined values indicative of target machine performance. This embodiment enables the operator to be
25 automatically informed if the takings from the machine are unacceptable over a period of time, possibly indicating that the machine should be replaced by a different machine.

In another embodiment the processing means is adapted to compare an amount indicative of the takings of the or each machine, as determined by the detector means, with an amount indicative of the takings collected from the or each machine, as entered into the device by the user. This ensures correlation between the amount taken out of a machine on a periodic basis and the takings of the machine as actually recorded.

In a further embodiment the processing means is adapted to determine when the level of tokens and/or coins of a particular denomination in the machine or one of the machines is below a minimum acceptable level. This embodiment can be used to ensure that a machine is never out of order for the reason that it is out of tokens or coins of a particular denomination.

In order that the invention may be more fully understood, a preferred embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings in which:

Figures 1 to 4 are block diagrams of portions of the device illustrating different monitoring functions of the device.

Referring to the drawings the device 10 is an interface controller adapted to be installed at a suitable location, for example on a wall behind the bar of a public house, and to be connected to one or more coin-operated amusement machines 11 by input lines which provide data indicative of coin movements within the machines, of

whether the machines are switched on, of whether the cash collection door of each machine has been opened and of whether the coin or token level within each machine is low. The device 10 is connected to a telephone line for reporting information to a remote location, such as a machine operator's receiving installation, which may comprise an autoreceive modem 12 connected to a printer 13 and an alarm 14.

Referring to Figure 1 the device 10 incorporates a detector 20 connected to a real time clock 21 and an opening hours memory 22 for determining whether each machine 11 is switched on at the required times. The detector 20 supplies an output to an option selector 23 if one or all of the machines 11 are not switched on at the required times. The selector 23 may be preset to cause one of three possible options to be actuated by this condition. If option 1 is selected the or each machine 11 which is not switched on is switched on by a unit 24, and a check is made that the or each machine is switched on by a feedback control unit 25.

If option 2 is selected an audio alarm 26 is actuated indicating that one or more of the machines 11 is not switched on. If the alarm 26 is not cancelled by switching on the appropriate machine or machines 11, a unit 27 connected to a real time clock 28 supplies a signal to a report control unit 29 indicating that a report is to be sent to the remote location. If option 3 is selected a signal is supplied directly to the report

control unit 29 indicating that a report is to be sent to the remote location.

When an appropriate signal is received by the report control unit 29, the telephone number of the remote location is obtained from a memory 30, and this number is caused to be called by an autodial modem 31. When confirmation is received by the modem 31 that the call is connected, appropriate information is transmitted along the telephone line to the remote autoreceive modem 12. Such information is obtained from a memory 32, and will include data indicative of the site location, the fact that one or more of the machines has not been switched on and an identification of the or each machine which has not been switched on. The printer 13 will provide a permanent record of such information, together with an indication as to the times at which the condition was noted by the report control unit 29 and at which the report of this condition was received at the remote location (after possible delay in obtaining the number called).

Referring to Figure 2 the device includes a detector 40 for determining when one of the machines 11 is out of order and is not being played. In the event of such a condition occurring a signal is outputted to an option selector 41 which is preset to cause one of three possible options to occur. If option 1 is selected a terminal controller 15, which may be separate from the device 10, must be operated by a person on site, such as the manager, in order to confirm that there is a fault,

and that the machine is not simply not being played because it is not switched on or for some cause which is easily rectified by the manager himself. The manager will be required by the controller 15 to provide answers to various questions. If the information provided by the manager indicates that there is a fault which should be reported to the remote location, this is acknowledged by a unit 42 and an appropriate signal is supplied to the report control unit 29 to initiate reporting of the fault to the remote location in a similar manner to the reporting of the condition described with reference to Figure 1.

If option 2 is selected an audio alarm 43 is actuated on occurrence of an out of order condition and an appropriate signal is supplied to the report control unit 29 by a unit 44 connected to a real time clock 45 if the alarm 43 has not been cancelled by rectifying the out of order condition after a predetermined length of time. If option 3 is selected an appropriate signal is directly supplied to the report control unit 29 indicating a reportable fault condition.

It should be appreciated that certain machines will not always provide a direct indication of an out of order condition, in which case it will be necessary to enable the occurrence of a fault to be reported by the manager by means of the terminal controller 15. The manager will be required by the controller 15 to provide identification of the machine out of order.

Referring to Figure 3 the device 10 includes a transaction accumulator 50 connected to a real time clock 51 and adapted to maintain a record of transactions conducted on each machine 11, including all coin movements and openings of the cash collection door, together with the times of such transactions. At periodic intervals the manager will collect the takings from the machines 11 by opening the cash collection doors, and will enter the takings collected on the terminal controller 15. The amounts entered on the controller 15 will be compared with the takings of each machine 11 as indicated by the accumulator 50 by means of a comparator 52. The results of such comparisons and the total takings will be supplied to a reconciliator 53 which will compare any deviations between cash collected and recorded takings with acceptable deviations stored in a table 54, and which will also compare the takings with targets also stored in the table 54. The reconciliator 53 may be adapted to supply a signal to the report control unit 29 to cause a report to be sent to the remote location in the event that there is an unacceptable discrepancy between the cash collected and the recorded takings or in the event that the takings are below target figures indicating that the performance of the machine is unsatisfactory. Additionally the reconciliator 53 may be adapted to supply a signal to the report control unit 29 in order to cause a report of the takings to be sent to the remote location even where there is no unacceptable discrepancy

and the machine performance is satisfactory.

Referring to Figure 4 the device 10 includes a coin flow calculator 60 for determining the state of cash float within each machine 11, and a machine token/coin input 61 for receiving an indication from each machine 11 of the level of tokens or coins within the machine 11. In the event that the level of tokens or coins within any machine 11 falls below an acceptable level, as indicated by either the calculator 60 or the input 61, this is registered by a detector 62. This condition may be reported by the detector 62 to the manager by means of the terminal controller 15, or to the remote location by supply of a signal to the report control unit 29.

The terminal controller 15, which may be a separate unit from the device 10 and may in particular form part of a cash register or point of sale terminal, will comprise a series of function keys, and preferably also a display for acknowledging function key operation and/or interrogating the operator. In this manner the input of information to the device 10 by the manager will be rendered particularly straightforward. The device may also include an output port for temporary connection of a portable recording unit so as to enable transaction data from the device to be recorded for subsequent analysis away from the site at which the machines are located.

The device described is particularly advantageous in use for the following reasons:

1. It enables cash to be collected by the manager,

thus saving the cost of a third party collector.

2. It enables the takings to be automatically reported to a remote location, such as the brewery.

3. It ensures that the machine is switched on
5 during opening hours.

4. It ensures that machine faults are promptly reported to the operator.

5. It ensures that a decision may be taken as to whether to replace the machine as soon as possible after
10 the performance of the machine begins to deteriorate.

6. It ensures that the cash float within the machine is maintained at an adequate level.

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CLAIMS

1. A device for monitoring operation of one or more amusement machines, the device comprising detector means for receiving input signals from the or each machine and
5 for emitting output signals indicative of an operational state of the or each machine, processing means for receiving said output signals and for outputting an error signal when the form of the output signals is such as to indicate that a parameter of the operational state of the
10 or a machine is outside a permitted range, and remote reporting means for causing a predetermined telephone number to be dialled in the event that an error signal is outputted by the processing means which is indicative of a reportable condition and for causing the dialled number to
15 be automatically supplied with report data on the operational state of the relevant machine.
2. A device according to claim 1, wherein the processing means is adapted to determine the or each machine is switched on at predetermined times.
- 20 3. A device according to claim 2, including alarm means arranged to be actuated by the processing means in the event that the machine or one of the machines is not switched on at the predetermined times.
4. A device according to claim 3, wherein the
25 processing means is adapted to actuate the remote reporting means in the event that the machine has not been switched on a predetermined time after actuation of the alarm means.



5. A device according to any preceding claim, wherein the processing means is adapted to determine whether the or each machine is out of order.

6. A device according to claim 5, including fault
5 acknowledgement means adapted to actuate the remote reporting means in the event that an error signal is outputted by the processing means only after the existence of a fault has been acknowledged by a manual key operation.

10 7. A device according to any preceding claim, wherein the processing means is adapted to compare actual machine performance with predetermined values indicative of target machine performance.

8. A device according to any preceding claim,
15 wherein the processing means is adapted to compare an amount indicative of the takings of the or each machine, as determined by the detector means, with an amount indicative of the takings collected from the or each machine, as entered into the device by the user.

20 9. A device according to any preceding claim, wherein the processing means is adapted to determine when the level of tokens and/or coins of a particular denomination in the machine or one of the machines is below a minimum acceptable level.

25 10. A device for monitoring operation of one or more amusement machines, the device being substantially as hereinbefore described with reference to the accompanying drawings.